

# BIOCHEMISTRY AND MOLECULAR BIOLOGY (PH.D.)

The Department of Biochemistry, Microbiology & Immunology offers a program of coursework and experimental research leading to a doctoral degree in Biochemistry & Molecular Biology. Areas of strength within the department include the molecular biology of gene structure and function, bioenergetics, enzymology, and macromolecular structural biology.

## Admission Requirements

Admission to these programs is contingent upon admission to the Graduate School (<http://bulletins.wayne.edu/graduate/general-information/admission/>) and the graduate programs of the School of Medicine (<http://bulletins.wayne.edu/graduate/school-medicine/programs/>).

Applicants for the Doctor of Philosophy degree must complete ninety credits, including at least thirty credits in research and dissertation, at least six credits in a minor and the remaining credits distributed between the major and required cognate courses and electives.

In their first year, all Ph.D. graduate students in the School of Medicine's Interdisciplinary Biomedical Sciences (IBS) program (of which we are a part) participate in a combined First Year curriculum, which provides broad-based knowledge in important areas of fundamental biomedical research. Faculty from all departments participate in the teaching, which emphasizes critical discussion of primary and secondary literature. The fall semester covers Molecular and Cell Biology. During the winter semester of the first year, coursework includes two two-credit IBS course offerings chosen by the student, together with two departmental courses that are required for our Ph.D. students: Protein Structure and Function (BMB 7320) and Molecular Biology (BMB 7330).

In addition to these courses, first-year students undertake a series of ten-week laboratory rotations designed as in-depth introductions to the laboratories of their greatest interest. During the first weeks of the fall semester, faculty with slots available in their laboratories participate in a briefing session for incoming students to describe their research work. Further one-on-one discussion with individual faculty members is also encouraged. Students are urged to gather as much background information as possible before making these choices as they are likely to be a major factor in determining the direction of their entire professional career. Generally, each student does three rotations during the fall and winter semesters, and on the basis of this experience, chooses the laboratory in which they will carry out their doctoral research.

After the first year in the program, students choose courses from anywhere in the University, to focus on their particular interests. Six credit hours in an appropriate minor are required, which need not be confined to coursework offered in the School of Medicine. Favorite choices for the minor include courses in computer science or chemistry. In addition, all students in year 2 and beyond are required to register for Journal Club (BMB 7890) each year. It is expected that most course work will be completed by the end of the second years. A minimum g.p.a. of 3.0 must be maintained throughout the program.

A written comprehensive qualifying exam is administered near the end of the first year, followed by an oral examination by the student's dissertation committee in the area of the proposed thesis research. The dissertation committee should ideally be selected in the Fall semester of Year 2. The committee is composed of the Advisor to the candidate and three other members, including two faculty from the Department of Biochemistry, Microbiology & Immunology whose primary affiliation is with the Biochemistry & Molecular Biology program. Subsequent years

are primarily devoted to dissertation research. Each student in the third year and beyond is required to meet with their dissertation committee once a year (twice if the committee calls for it), to discuss progress in their research projects.

Each student must arrange a program in an area of minor concentration with a representative of the department in which he/she plans to minor and preferably with the representative on the doctoral committee. Areas of minor concentration include organic chemistry, physical chemistry, physical-organic chemistry, microbiology or immunology, pharmacology, physiology, biology, and computer science.

The thirty credit dissertation registration requirement is fulfilled by registering for the courses BMB 9991, BMB 9992, BMB 9993, and BMB 9994 (Doctoral Dissertation Research and Direction I, II, III, and IV, respectively), in consecutive academic year semesters.

**Academic Scholarship:** All course work must be completed in accordance with the regulations of the Graduate School (<http://bulletins.wayne.edu/graduate/general-information/academic-regulations/>) and the School of Medicine (<http://bulletins.wayne.edu/graduate/school-medicine/programs/>) governing graduate scholarship and degrees.